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Docket No.

81317RLO(87583.096600)

Application No.

09/627,802

Filing Date

July 28, 2000

Examiner

Dalei Dong

Customer No.

34799

Group Art Unit

2875Invention: **PROCESS FOR LAMINATING ELECTRICALLY ADDRESSABLE DISPLAY**I hereby certify that this **Appeal Brief including Appendix A & B in triplicate (total 90 pages)**

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PATENT APPEAL BRIEF
DOCKET: 81317RLO (87583.096600)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Dwight J. Petruchik

PROCESS FOR LAMINATING
ELECTRICALLY ADDRESSABLE
DISPLAY

Serial No. US 09/627,802

Filed 28 July 2000

Group Art Unit: 2875

Examiner: Dalei Dong

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Kathleen A. Manczuk
Kathleen A. Manczuk
7/15/2004
Date

Commissioner for Patents
MAIL STOP: APPEAL BRIEF - PATENTS
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Further to the Notice of Appeal filed on 16 March 2004 in the above-
referenced case, Applicant hereby submits in triplicate this Appeal Brief having a
filing deadline of 16 May 2004, which filing deadline has been extended to 16 July
2004 by the petition for extension of time submitted herewith.

1. Real party in interest

The real party in interest is Eastman Kodak Company, a New Jersey
corporation having a place of business at 343 State Street, Rochester, New York
14650.

2. Related appeals and interferences

None.

3. Status of claims

Claims 1-16 are pending. No claims are allowed and all claims are rejected only under 35 USC Section 103(a) based on one or more combinations of references.

4. Status of amendments

No amendments after final were submitted.

5. Summary of invention

The invention is for a process of laminating a **flexible** electrically addressable **display** with one or more **protective sheets** and the product made by the laminating process. FIGS. 1A and 1B show an electrically addressable liquid crystal display 11 between protective sheets 12 and 13. The resulting assembly passes between two heated laminating rollers R1 and R2 to form a laminate 14. Display 11 is viewable through display window 15 in the protective sheets.

Protective sheet 13 includes a contact aperture 16 to enable electrical contact with display 11. If display 11 includes a durable substrate, as described below, protective sheet 12, which would be in contact with that substrate, may be omitted. Protective sheets 12 and 13 may be formed from various materials, for example, polyesters, polyolefins, polycarbonates, vinyl resins, acrylic resins, and methacrylic resins.

Laminating rollers R1 and R2 apply heat to form laminate 14. Heating is carried out at a temperature of about 25EC to about 150EC, together with an applied pressure of about 1 kg/cm² to about 5 kg/cm². An adhesive resin 17, which may be either a homopolymer or co-polymer adhesive resin, is applied to one or both inner surfaces 18 and 19 of sheets 12 and 13, respectively, to ensure strong lamination.

One or more **printed sheets** 12, 13 are inserted between protective sheets 12, 13, respectively, and display 11. See FIG. 2A. Where an intended application of laminate 24 is, for example, a bank credit or debit card, a telephone card, a sign, a clock, or an advertising display, printed sheets 21 and 22 may include text, illustrations, or logos.

FIG. 3 shows details of an electrically addressable liquid crystal display 30

that can be used as display 11 in the above-described laminates 14 and 24. Liquid crystal display 30 includes a **flexible** substrate 31, preferably polyester, and a transparent, first electrically conductive layer 32, preferably of indium-tin oxide (ITO), disposed on **flexible** substrate 31.

A light modulating layer 33 of liquid crystalline material, preferably a cholesteric material, and a polymeric binder, preferably deionized gelatin, is disposed on electrically conductive layer 32. A patterned layer comprising areas 34 of opaque electrically conductive material is disposed on light modulating layer 33. The opaque material in areas 34 preferably comprises electrically conductive ink, which can be applied by various printing techniques, for example, screen, ink jet, or offset printing.

A dielectric layer 35 disposed on the patterned layer areas 34 has contact apertures 36 to areas 34. A second electrically conductive layer 37 on dielectric layer 35 extends through contact apertures 36 to areas 34 and to first electrically conductive layer 32.

6. Issues

The claims are patentable over the art of record as applied by the final rejection.

7. Grouping of claims

Claims 1, 4, 5, 6, 7, 8, 9, 12, and 13 stand or fall together.

Claim 2 stands or falls alone.

Claims 3, 14, 15 and 16 stand or fall together.

Claims 10 and 11 stand or fall together.

8. Argument

Introduction

The following remarks will show that the references of record do not show or suggest protective sheets and do not show or suggest flexible displays that are covered with protective sheets.

Details of the final rejection are found in the attached Appendix B. It is a copy of the final office action. In summary, the rejection argues that the Ditzik reference (US 4,442,732) has a flexible liquid crystal display and substitutes that display into the rigid assembly of Itou reference (US 6,556,260) where the rejection further argues that the structural substrates 11, 12 of Itou's display are the protective sheets of the claims. The following comments will show that the final rejection has major errors. The rejection erroneously interprets as flexible, the rigid liquid crystal display in Ditzik and improperly construes the substrates of Itou as protective sheets.

Claim interpretation

Claim 1 is a method claim for assembling elements into a laminated, flexible addressable display. Its first step is providing the **flexible**, liquid crystal **display**. The second step is placing a **protective sheet** over at least one of surfaces of the display. The protective sheet is a separate element from the flexible liquid crystal display. As will be shown below, the rejection fails to find these separate elements in the art of record.

Each claim requires a flexible liquid crystal display and at least one protective sheet. All displays, rigid and flexible, must have liquid crystal material and a structure for holding the liquid crystal material in place. In the claimed invention the flexible display has a protective sheet over a surface of the display. Thus, the protective sheet is a separate element from the flexible display and one that covers the flexible display.

Claims are given their broadest reasonable interpretation and the words of claims are given their plain meaning. The plain meaning of the term "flexible" is bendable without breaking. See The Random House Dictionary of the English Language, 2d edition, page 733 (1987); www.dictionary.com.

Applicable law and procedures

A prima facie case of obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992) (Emphasis Added). Thus, where a proposed combination does not produce the claimed invention, a prima facie case of obviousness has not been established. In addition, the prior art or references, when combined, must teach or suggest all the limitations of the claims. MPEP 2143, 8th Edition, page 2100-129 and 2143.03 at page 133. When an element or a reference as a whole is modified and used to make a rejection, the proposed modification cannot render the reference or the element of the reference unsatisfactory for its intended purpose. MPEP 2143.01 at 2100-131. It is also impermissible to change the principle of operation of a reference as a whole or its component parts that are used in a rejection. MPEP 2143 at p. 132.

Ditzik has no flexible display

Claim 1 has a **flexible display**. The Ditzik reference fails to show both a **flexible display**. In this regard, the common dictionary meaning of “flexible” is “bendable.” See Dictionary.com. One cannot bend the Ditzik display without breaking the glass substrate 54A.

Ditzik has a display where liquid crystal material is held between a rigid glass substrate 54A and layers 58A, 58B. That display is rigid because at least one substrate of the display is rigid. The structure shown in FIG. 6 of Ditzik cannot be flexed or bent without breaking. This is elemental mechanics and common sense.

A rigid body does not become flexible by covering it with a flexible material. If one takes a glass sheet, such as substrate 54A of Ditzik, puts liquid on top of one surface and then attaches a cover over the liquid to seal the liquid between the cover and the glass sheet, the resulting structure is rigid and will not flex or bend. The rigid

nature of glass is not changed by layers 58A and 58B. Even if the layers 58A and 58B are flexible before they are joined to the glass layer 54B, the combined structure that forms the display is not flexible. The glass substrate 54A of the Ditzik display is rigid and remains rigid thus imparting its rigidity to Ditzik's display.

*Protective sheets are not
part of display*

On page 10 of the Final Office Action, the Examiner argues that “nowhere in the claim does the Applicant mention that the protective sheets of the claim invention **are not** part of the liquid crystal display.” (Emphasis added.)

That statement is clearly erroneous. There is no requirement to claim what an invention is **not**. Moreover, the claims do separate the protective sheet(s) from the display. Claim 1 expressly calls for applying a protective sheet to a flexible display. Thus, claim 1 does require a protective sheet that is separate and not a part of the display. In effect, the rejection of the Examiner reads the limitation of “protective sheet” out of the claim.

Applicant's position is supported by precedent. See *In re Straub*, 51 C.C.P.A. 1098; 328 F.2d 999; 1964 CCPA LEXIS 444; 140 U.S.P.Q. (BNA) 655 (CCPA 1964.) In that case the claims on appeal recited a metal annulus disposed in a metal ring on a tray. In the appealed application, the drawings showed separate metal rings and metal annuli and the specification described the separate elements of rings and annuli. The Board and the examiner both interpreted the term “annulus” to be portions of the references which surrounded openings in trays, rather than as separate elements as required by the claim. The CCPA reversed. Here, the Examiner is making a similar error by not giving weight to the express limitation of a separate, protective sheet.

Itou has no protective sheets

Itou does not have protective sheets. Itou shows a rigid, conventional liquid crystal display that has liquid crystal material 10 disposed between two glass substrates 11 and 12. It has no protective sheet as required by claim 1. However, the rejection interprets the substrates of the display as “protective sheets.” See paragraph 2 of the final office action. (“Regarding to claims 1-4, 6-7, 10-11, 13-14 and 16, Itou teaches in Figure 1, a liquid crystal display comprising "a first substrate 11 of the pair of substrates 11 and 12 (*protective sheets*)”). (Emphasis original.)

That statement is erroneous. Itou’s substrates 11 and 12 are not “protective sheets” but are convention structural substrates of the liquid crystal display. If Itou is interpreted to have protective sheets, then it is missing the structural elements necessary for an operative liquid crystal display.

*Erroneous to modify an element of a reference
to find a limitation not disclosed in the reference*

The rejection erroneously modifies the teaching of Itou to convert structural substrates 11, 12 into the “protective sheets.” The substrates 11, 12 are structural elements used by Itou to hold and retain the liquid crystal and to support the conductive and opaque layers.

*Erroneous to use one element in a reference
to meet two separate limitations in a claim*

In the rejection the substrates 11, 12 are interpreted as “protective sheets” and also as part of the display. See Final Office Action of 12/18/2003 page 2 where the action finds that Itou has a rigid liquid crystal display and has protective sheets. That is clearly erroneous. It is impermissible to use one element in a reference to find two elements of a claim without some support in the reference itself for such use. Itou provides no such support.

If Itou's substrates 11, 12 are protective sheets, then Itou has no display

Elements in a reference must be construed consistently with the express teaching of the reference. If an element is modified or adapted for a different purpose, then it cannot retain its original function or operation. Assume, for the sake of argument, one interprets substrates 11 and 12 as protective sheets. That interpretation removes the substrates from the display. Without the substrates, Itou has no structure for retaining and holding the liquid crystal material and no structure for supporting the electrodes.

Claim 1 calls for a protective sheet **and** a flexible display. If the rejection interprets the substrates of the display as "protective sheets" then the remaining components in Itou's assembly no longer form a display. The rejection tries to overcome this deficiency by substituting the alleged flexible display of Ditzik into Itou. But that is illogical. The rejection first cites Itou for having a rigid display and protective sheets. If the sheets, as demonstrated above, are really part of the display, then they cannot and should not be partitioned from the display. If they are removed, then Itou has no rigid display and there is no basis for substituting the alleged flexible display of Itou between two "protective sheets."

In claim 1 the protective sheet is placed over the display. In Itou, the alleged protective sheet (substrate 11 or 12) is already part of the display. Itou has no disclosure of making a display without using both substrates 11 and 12 and nowhere does he refer to them as protective sheets that are placed over a display. In Itou the substrates 11, 12 are integral parts of Itou's liquid crystal display. The rejection treats the substrates 11, 12 as protective sheets that are elements separate from the liquid crystal display. But that interpretation is contrary to the express teachings of Itou.

Erroneous to modify Itou

MPEP Section 1243.1 prohibits an examiner from modifying a reference to render the reference unsatisfactory for its intended purpose. The rejection violates this cannon of procedure. Here, in order to find protective sheets for the rejection, the Examiner modified component substrates of Itou's display and, without any support in Itou, equates the substrates to the protective sheets of claim 1. That is a

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fundamental error. The substrates 11, 12 are intended to be structural parts of the display, not protective sheets.

No motivation to combine references

There is no motivation in either reference to make the claimed combination. Ditzik and Itou are distinct and separate displays. Neither is a flexible display and, without such a flexible display there is no inherent motivation to provide one or more protective sheets. Stated another way, the problem of protecting displays does not arise where the display comprises structural glass substrates. The problem arises when the display is flexible.

If the references are combined using their own terms and what they fairly suggest, the net result would be the rigid display of Ditzik on a rigid substrate covered with the rigid glass substrates of Itou. The net result would still not be a flexible display with a protective sheet.

Claims 1, 4, 5, 6, 7, 8, 9, 12, and 13.

These claims are patentable over the art of record for the reasons given above.

Claim 2

Claim 2 is patentable for the same reasons as claim 1 and for the further reason that because the art of record does not show a protective sheet or a flexible display, it also fails to show providing an adhesive resin between the protective sheet and the surface of a flexible display.

Claim 3, 14, 15 and 16

These claims are patentable over the art of record for the same reasons as claim 1 and for the further reason that the art of record does not show the particular relationship among the elements recited in the claims.

The claims are rejected based upon a combination, *inter alia*, of Itou and Ditzik. However, one would have to make major modification to Ditzik without any

direction in any reference to adapt the Ditzik components to an addressable liquid crystal display.

Ditzik is not addressable. Instead it provides a raster image formed by a moving laser beam. Nothing in Ditzik suggest adapting its display to a conventional, addressable liquid crystal display and nothing in Itou suggests using a laser operated display.

Claims 10 and 11 are patentable

Claim 10 depends from claim 1 and adds the further step of inserting a first printed sheet between the first surface of the flexible display and the first protective sheet. Claim 11 depends from claim 10 and adds the step of inserting a second printed sheet. The final rejection rejects these claims based on Itou, Murouchi (US 6,036,568) and Ditzik. However, the rejection fails to identify any printed sheet in any of the references. Since the printed sheets of claims 10 and 11 are not identified in the cited references, these claims are patentable.

Conclusion

The claims as presented are patentable over the art of record that is applied to reject the claims. The Ditzik reference has no flexible display and Itou either (1) has no protective sheets or (2) has glass (protective) sheets and an inoperative display that has no structural components for retaining the liquid crystal material. It is improper to use the substrates of Itou for two elements in the claims (protective sheets and display substrate) without an express teaching in Itou of such double use.

Respectfully submitted,



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PATENT APPEAL BRIEF
DOCKET: 81317RLO (87583.096600)

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APPENDIX A

CLAIMS ON APPEAL

1. (*Original*) A process for laminating a flexible electrically addressable display, said process comprising:

providing a flexible, electrically addressable liquid crystal display having first and second surfaces;

placing a protective sheet over at least one of said first and second surfaces;
and

subjecting said protective sheet to conditions of temperature and pressure effective to cause said protective sheet to adhere to said surface, thereby forming a laminate comprising said electrically addressable liquid crystal display.

2. (*Original*) The process of claim 1 further comprising:

providing an adhesive resin between said protective sheet and said surface prior to said applying heat and pressure.

3. (*Original*) The process of claim 1 wherein said flexible, electrically addressable liquid crystal display comprises:

a flexible substrate;
a transparent, first electrically conductive layer disposed on said substrate;
a light modulating layer comprising liquid crystalline material and a polymeric binder disposed on said electrically conductive layer;
a patterned layer comprising areas of opaque electrically conductive material disposed on said light modulating layer;
a dielectric layer disposed on said patterned layer, said dielectric layer comprising contact apertures to said areas of opaque electrically conductive material and to said first electrically conductive layer; and
a second electrically conductive layer overlying said dielectric layer and extending into said contact apertures to said areas of opaque electrically conductive material and to said first electrically conductive layer.

4. (*Original*) The process of claim 3 wherein said substrate comprises polyester and said first electrically conductive layer comprises indium-tin oxide (ITO).
5. (*Original*) The process of claim 3 wherein said liquid crystalline material comprises cholesteric material and said polymeric binder comprises deionized gelatin.
6. (*Original*) The process of claim 3 wherein said areas of opaque electrically conductive material comprise electrically conductive ink.
7. (*Original*) The process of claim 1 wherein said protective sheet is formed of a material selected from a group consisting of polyesters, polyolefins, polycarbonates, vinyl resins, acrylic resins, and methacrylic resins.
8. (*Original*) The process of claim 2 wherein said adhesive resin is selected from the group consisting of homopolymer and co-polymer adhesive resins.
9. (*Original*) The process of claim 1 wherein said applying heat is at a temperature of about 25°C to about 150°C and said applying pressure is at a pressure of about 1 kg/cm² to about 5 kg/cm².
10. (*Original*) The process of claim 1 further comprising:
inserting a first printed sheet between said first surface and a first protective sheet.
11. (*Original*) The process of claim 10 further comprising:
inserting a second printed sheet between said second surface and a second protective sheet.
12. (*Original*) The process of claim 1 wherein at least one protective sheet comprises a contact aperture to said electrically addressable liquid crystal display.

13. (*Original*) A laminated electrically addressable liquid crystal display formed by the process of claim 1.

14. (*Previously Presented*) A process for laminating a flexible electrically addressable display, said process comprising:

providing a flexible, electrically addressable liquid crystal display having first and second surfaces and comprising:

a transparent, first electrically conductive layer disposed on said substrate;

a light modulating layer comprising liquid crystalline material and a polymeric binder disposed on said electrically conductive layer;

a patterned layer comprising areas of opaque electrically conductive material disposed on said light modulating layer;

a dielectric layer disposed on said patterned layer, said dielectric layer comprising contact apertures to said areas of opaque electrically conductive material and to said first electrically conductive layer; and

a second electrically conductive layer overlying said dielectric layer and extending into said contact apertures to said areas of opaque electrically conductive material and to said first electrically conductive layer;

placing a protective sheet over each of said first and second surfaces of said electrically addressable liquid crystal display; and

subjecting said protective sheets to conditions of temperature and pressure effective to cause said protective sheets to adhere to said first and second surfaces, thereby forming a laminate comprising said electrically addressable liquid crystal display.

15. (*Original*) The process of claim 14 wherein said substrate and said protective sheets comprise polyester, said first electrically conductive layer comprises indium-tin oxide (ITO), said liquid crystalline material comprises a cholesteric material, said polymeric binder comprises deionized gelatin, and said areas of opaque electrically conductive material comprise electrically conductive ink.

16. (*Previously Presented*) A process for laminating a flexible electrically addressable display, said process comprising:

providing a flexible, electrically addressable liquid crystal display having first and second outer surfaces, said first outer surface comprising a flexible substrate of the display, said second outer surface comprising an electrically conductive layer overlying a dielectric layer;

placing a protective sheet over at least one of said first and second surfaces;
and

subjecting said protective sheet to conditions of temperature and pressure effective to cause said protective sheet to adhere to said surface, thereby forming a laminate comprising said electrically addressable liquid crystal display.

APPENDIX B
COPY OF
FINAL OFFICE ACTION
OF DECEMBER 18, 2003



UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/627,802	07/28/2000	Dwight J. Petruchik	81317RLO	3584

1333 7590 12/18/2003

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EXAMINER

DONG, DALEI

ART UNIT

PAPER NUMBER

2875

DATE MAILED: 12/18/2003

EASTMAN KODAK CO.

DEC 23 2003

Patent Legal Staff

Control by NAB

Please find below and/or attached an Office communication concerning this application or proceeding.

TO:

Response to FINAL
due: 2-18-04
DOCKETED
12/30/03 PC

Office Action Summary

Application No.

09/627,802

Applicant(s)

PETRUCHIK, DWIGHT J.

Examiner

Dalei Dong

Art Unit

2875

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 November 2003.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4, 6-7, 9-14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,556,260 to Itou in view of U.S. Patent No. 6,036,568 to Murouchi in further view of U.S. Patent No. 4,422,732 to Ditzik.

Regarding to claims 1-4, 6-7, 10-11, 13-14 and 16, Itou teaches in Figure 1, a liquid crystal display comprising "a first substrate 11 of the pair of substrates 11 and 12 (*protective sheets*) is made of borosilicate glass and is 0.7 mm thick. On the surface of substrate 11 facing the liquid crystal layer 10 (*a light modulating layer comprising liquid crystalline material and polymeric binder*), there are sequentially laminated a flat light source 31, a first insulation layer 42, and a common electrode 20 (*a transparent first electrically conductive layer*). On the other hand, the second substrate 12 is made of the same material and has the same thickness, and on the surface of the second substrate 12, there are mounted a reflecting electrode 21 (*a patterned layer comprising areas of opaque electrically conductive material or ink*), active elements 46 and so on" (column 9, line 45-53).

Itou also teaches in Figure 1, "each of the plurality of portions of reflecting electrode 21 is connected with an active element 46 via a conductor in a through-hole 41 (*apertures*). Between the reflecting electrode 21 and active element 46, there are provided a second insulation layer 43 (*a dielectric layer disposed on the patterned layer, the dielectric layer comprising contact apertures to the areas of opaque electrically conductive material*) made of SiN.sub.x and a first irregularity formed layer 45, for insulating therebetween. The first irregularity formed layer 45 is provided in order to form the reflecting electrode 21 that has irregular surfaces. By provision of irregular surfaces on the reflecting electrode 21, the light that has passed through liquid crystal 10 is reflected as scattered light, which provides an advantage in that the background of the user is prevented from being reflected by the reflecting electrode 21 toward the user, and also the whole area of liquid crystal layer 10 is illuminated" (column 11, line 6-20).

However, Itou does not disclose the liquid crystal display is flexible and the protective sheets are subjecting to conditions of temperature and pressure effective to cause the protective sheet to adhere to the surface.

Murouchi teaches in Figure 1, "After such a rough alignment is carried out, the upper and lower substrates 2 and 1 are pressed on each other by means of the upper and lower stages 7 and 6 (S4) (FIG. 23(c))" (column 5, line 6-8).

Murouchi also teaches in Figure 1, "then, the temporary fixing resins 3 serving as the UV curing agents applied at step S1 are irradiated with ultraviolet light by means of UV lamps 9 to be cured to carry out a temporary fixing (S6)." (column 5, line 11-15).

Murouchi further teaches in Figure 1, "then, the sealing jig filling is carried out with respect to the pair of substrates 1 and 2 temporary fixed to each other (S8)" (column 5, line 21-23).

Murouchi further yet teaches in Figure 1, "in this state, the sealing resin (sealing material) 4 is heated to be cured so that the sealing is carried out (S9)" (column 5, line 24-25).

However, Murouchi fails to teach a flexible liquid crystal display. Ditzik teaches in Figure 5, "one thick rigid substrate and a plurality of optically clear, thin flexible membranes. In the embodiment shown, the front electrode 55B is not coated onto a thick glass substrate, as on other known LC panels, but rather it is deposited on an optically clear 2-5 mil polyester film 58A. This film 58A(*flexible substrate*), is placed over the liquid crystal layer 51 to form the cell. Indium-tin oxide coated polyester membranes are available in thickness 3-7 mils from Seirracin Incorporated, under the INTREX product name. An alternate transparent membrane could be ITO coated Corning MICROSHEET glass. The purpose of the thin transparent flexible membrane 58A is that it can be sandwiched into place in such a manner as to follow the irregularities of the rear electrode-substrate surface. This produces a relatively constant thickness LC layer, over large areas. Thus, it is possible to build liquid crystal panels that are many times larger than previously realized. To provide some rigidity to the membrane 58A, another polyester of MICROSHEET membrane 58B (*second protective sheet*), is bonded to the first membrane 58A with an optically clear epoxy glue. When the epoxy cures, the two films will be relatively rigid and the LC layer thickness will be held constant. The epoxy

glue to be employed can be the same type used to bond faceplates to CRT screens. To further protect the liquid crystal cell, the front substrate 54B is placed over the LC sandwich separated by perimeter spacers 52B, creating an air gap 59. Although the air gap 59 is kept to a minimum, it shall be large enough to clear all dimensional irregularities of the film layers 58A and 58B. Since moisture reacts with liquid crystal compounds, a suitably hermetic water tight seal is necessary around the perimeter of the panel 50. Standard seals, such as glass frits, solder glasses, or polymeric materials can be employed. Preferably the panel spacer and seal may be combined into one element performing both functions" (column 7, line 42 to column 8, line 14).

It would have been obvious one having ordinary skill in the art at the time the invention was made to have add the flexible membranes of Ditzik to the liquid crystal display of Itou and manufacture the display utilizing the method of Murouchi in order to reduce irregularities in thickness of the display device and reduce scars during manufacturing process and thus improve the picture quality of the liquid crystal display.

Regarding to claim 9, Itou in view of Murouchi in further view of Ditzik discloses the claimed invention except for the claimed optimum ranges of temperature and pressure. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have choose an optimum ranges of temperature and pressure for the sealing of the display, further since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding to claim 12, it has been held that to be entitled to weight in method claims, the recited-structure limitations therein must affect the method in a manipulative sense, and not to amount to the mere claiming of a sue of a particular structure. *Ex parte Pfeiffer*, 1962 C.D. 408 (1961).

3. Claims 5 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,556,260 to Itou in view of U.S. Patent No. 6,036,568 to Murouchi in further view of U.S. Patent No. 4,422,732 to Ditzik and yet in further view of U.S. Patent No. 3,816,786 to Churchill.

Regarding to claims 5 and 15, Itou in view of Murouchi and in further view of Ditzik discloses the claimed invention except for the liquid crystalline material comprises cholesteric material and the polymeric binder comprises dionized gelatin.

Churchill teaches "Various natural and synthetic film-forming polymeric materials can be employed to constitute the polymeric matrix, film or coating in which the individual droplets or inclusions of cholesteric liquid crystal material are located. Any transparent or substantially transparent film-forming polymeric material with adequate electrical insulation properties and which is soluble in a liquid which does not dissolve or substantially chemically affect the liquid crystal material adversely can be used. Suitable representative film-forming polymeric materials for this purpose include, but are not limited to, the following: polyvinyl alcohol; gelatin, gum arabic, zein, a prolamine film former derived from the alcohol extraction of zea mays, a grain commonly called Indian corn; hydroxy ethyl cellulose; polyvinyl pyrrolidone;

polyethylene oxide; copolymers of ethylene and maleic anhydride; copolymers of vinyl methyl ether and maleic anhydride; etc. The cholesteric liquid crystals can be dispersed or positioned within the polymer matrix conveniently by emulsifying minute droplets of liquid crystal material in a dryable liquid solution of the film-forming polymeric material which is to constitute the polymer matrix. According to a preferred embodiment of this invention, the droplets of liquid crystal material are emulsified in an aqueous solution of film-forming polymer. Since an extremely small droplet size of cholesteric liquid crystal material can be maintained in an emulsion, coatings of films prepared therefrom allow a good optical resolution and have a smooth surface(s). These characteristics enhance the optical or visual readout of display devices containing the droplets in the matrix. In general individual droplet size can range from about 0.5 to about 50 microns, but usually the individual droplet size ranges from about 1 to about 30 microns. Average droplet size can range from about 1 to 30 microns but usually ranges from about 5 to about 20 microns. Films prepared by drying these emulsions, containing the minute individual liquid crystal droplets or inclusions, can be stained or tinted as desired to enable the polymer matrix to serve as a color filter for light traveling to and from the liquid crystal material. Such a system can be used where a narrowing of the broad iridescent effect present in some liquid crystal materials in the second and third chromatic states is desired. Moreover, such films can also be pigmented slightly, but care should be exercised to avoid use of an excessive amount of pigment or other non-light reflecting material as it can diminish the color response and brilliance due to interference with incident and reflected light" (column 5, line 17-67).

It would have been obvious one having ordinary skill in the art at the time the invention was made to have add the flexible membranes of Ditzik and the liquid crystal material of Churchill to the liquid crystal display of Itou and manufacture the display utilizing the method of Murouchi in order to improve the quality of the light emitted and reduce irregularities in thickness of the display device and reduce scars during manufacturing process and thus improve the picture quality of the liquid crystal display.

4. Claim 8 rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,556,260 to Itou in view of U.S. Patent No. 6,036,568 to Murouchi in further view of U.S. Patent No. 4,422,732 to Ditzik and yet in further view of U.S. Patent No. 6,091,196 to Codama.

Itou in view of Murouchi and in further view of Ditzik discloses the claimed invention except for the adhesive resin is selected from the group consisting of homopolymer and co-polymer adhesive resin.

Codama teaches "After the protective layer has been formed, it is advantageous to bond thereto a sealing sheet so as to give a structure in which a region that excludes at least part of the terminal electrode 3 is sealed between the substrate 1 and the sealing sheet. This makes it possible to prevent the infiltration of moisture, and also increases the mechanical strength. Adhesion of the sealing sheet may be carried out using a photocurable adhesive, an epoxy adhesive, a silicone adhesive, or a crosslinked ethylene-vinyl acetate copolymer adhesive sheet, to name a few examples. Glass, ceramic, metal, resin or the like may be used as the sealing sheet" (column 13, line 16-26).

It would have been obvious one having ordinary skill in the art at the time the invention was made to have add the flexible membranes of Ditzik and seal the liquid crystal display of Itou with adhesive of Codama and manufacture the display utilizing the method of Murouchi in order to improve the seal of the device and prevent impurities from entering the display device and reduce irregularities in thickness of the display device and reduce scars during manufacturing process and thus improve the picture quality of the liquid crystal display.

Response to Arguments

5. Applicant's arguments filed November 24, 2003 have been fully considered but they are not persuasive.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Itou reference and Ditzik reference both teaches a liquid crystal display and Murouchi teaches a method of improving the method of assembly of a liquid crystal display. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have combine the features and improvements of liquid crystal display of Itou reference

and Ditzik reference and assemble the liquid crystal display with the improved method of assembly of Murouchi reference. Thus, Examiner asserts that the combinations of the references are valid and maintains the rejection.

Also, in response to Applicant's argument that the protective sheet does not subject to conditions of temperature and pressure; Examiner asserts that Murouchi reference clearly and distinctively teaches the substrate or the protective layer of the liquid crystal display is subject to vacuum or pressure and heating or temperature conditions during its assembly. Therefore, Examiner asserts that the prior art of record teaches the substrate or protective sheet subject to conditions of temperature and pressure to thereby cause the sheet to adhere to liquid crystal display. Thus, Examiner asserts that the prior art of record are valid and maintains the rejection.

Further, in response to Applicant's argument that the protective sheets of the claimed invention are not part of the liquid crystal display, per se, but rather are laminated on to the display having a flexible substrate; Examiner asserts that nowhere in the claim does not the Applicant mention that the protective sheets of the claimed invention are not part of the liquid crystal display. Thus, Examiner interprets that the protective sheets are an integral part of the liquid crystal display.

Furthermore, in response to Applicant's argument that the Ditzik reference teaches the away from the present invention of laminating a relatively small-sized flexible liquid crystal display; Examiner asserts that Applicant fails to claimed the specific size of the liquid crystal display, thus Examiner interprets all size of the liquid crystal display applied to the present claimed invention. Therefore, Examiner asserts that

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the Ditzik does not teach away from the present claimed invention and thus maintains the rejection.

Finally, in response to Applicant's argument that Ditzik reference fails to teaches a flexible substrate. Examiner asserts that Ditzik reference clearly teaches a thin film or flexible substrate in Figure 5. Albeit, multiple layers of the flexible thin film or flexible substrate may increase the rigidity of the flexible substrate, however Examiner interprets that the multiple layers of the thin film are still flexible after being combined. Thus, Examiner asserts that the Ditzik reference is valid and maintains the rejection.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

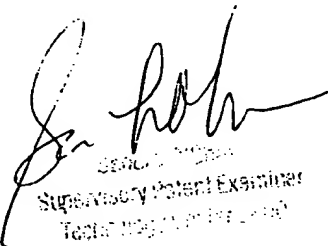
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalei Dong whose telephone number is (703)308-2870 (after January 14, (571)272-2370). The examiner can normally be reached on 8 A.M. to 5 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on (703)305-4939 (after January 14, (571)272-2378). The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

D.D.
December 11, 2003



DALEI DONG
Supervisory Patent Examiner
Technical Center for the Life Sciences